

ANNEX NO. 18
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER
AND
BLUE ORIGIN, LLC
UNDER SPACE ACT UMBRELLA AGREEMENT
NO. SAA-EA-20-29343, DATED 2/8/2020

ARTICLE 1. PURPOSE

The purpose of this reimbursable Annex is for NASA JSC to provide technical expertise and detailed test plans to Blue Origin in the area of human-rated spacecraft window technologies and capabilities. This agreement is the first in a series of Annexes intended to advance the Partner's development of improved spacecraft window materials and technologies for its commercial purposes, which could lead to lighter and safer window designs for NASA's Gateway, lunar missions, and future exploration missions. NASA JSC has the unique ability to perform window materials testing for spaceflight environments and standards using JSC facilities, and has extensive experience in the development and certification of spacecraft window systems for manned spaceflight vehicles.

This initial Annex will enable NASA JSC to define and maintain detailed test plans for a series of spacecraft window tests to be conducted by NASA for the Partner over a multi-year period detailed in Article 6. A total of five test plans will be created, and are estimated to include structural, environmental, optical, materials, and integration/assembly tests. Under this initial agreement, NASA JSC will provide the partner with expertise regarding NASA testing capabilities, testing requirements and design, and windowpane materials technologies. NASA JSC will also provide the Partner with access to NASA's Window Material Database (WinMD). The work to be performed for each test will be documented in future individual Annexes.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

ARTICLE 2. RESPONSIBILITIES

NASA will use reasonable efforts to:

1. Provide Blue Origin with access to NASA JSC's spacecraft window experts, expertise and knowledge base, including NASA's Window Material Database (WinMD).
2. Host in-person facility visits by Blue Origin personnel for available NASA test facilities, and provide information to Blue Origin on NASA capabilities for performing window testing.
3. Provide expertise to Blue Origin regarding the proper design of window tests.

4. Define detailed test plans for five individual window tests to be performed by NASA for Blue Origin.
5. Provide window test plan updates to Blue Origin as required due to the results of completed tests or in response to potential changes to Blue Origin's mission requirements.
6. Participate in biweekly technical interchange meetings with Blue Origin.

BLUE ORIGIN will use reasonable efforts to:

1. Provide Blue Origin spacecraft requirements to NASA JSC in support of NASA's design of a detailed window test plan for Blue Origin.
2. Provide inputs to NASA JSC related to windowpane materials technologies.
3. Provide feedback to NASA JSC regarding the individual window test plans and any test plan updates.
3. Participate in biweekly technical interchange meetings with NASA JSC.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

NASA JSC will provide Blue Origin with access to the WinMD database	ED + 2 weeks
Tours of NASA window testing facilities	ED + 2 months
NASA JSC will deliver initial window test plan to Blue Origin	ED + 2 months
NASA JSC will deliver additional window test plans and proposed updates to existing window test plans to Blue Origin	As required
Technical interchange meetings	Biweekly

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$215,655.64 for NASA to carry out its responsibilities under this Annex. Each payment shall be marked with NASA JSC and Annex No. 18.

B. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA

shall account for any unspent funds within one year after completion of all effort under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement. Return of unspent funds will be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of one year.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:

The Disclosing Party's Background Data, if any, will be identified in a separate technical document.

2. Third Party Proprietary Data:

The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.

3. Controlled Government Data:

The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:

None

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or until 2/8/2025, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Management Points of Contact

NASA Lyndon B. Johnson Space Center

Gregory F. Galbreath
Chief, Structures Branch
Mail Stop: ES2
2101 NASA Parkway
Houston, Texas 77058
Phone: 281-483-1270
gregory.f.galbreath@nasa.gov

BLUE ORIGIN, LLC

Wade Davis
Integrated Supply Chain Senior
Commercial Advisor
21218 76th Avenue S
Kent, WA 98032-2442
Phone: 316-655-8373
wdavis@blueorigin.com

Technical Points of Contact

NASA Lyndon B. Johnson Space Center

Lynda R. Estes
Structural Window Expert
Mail Suite: ES2
2101 NASA Parkway
Houston, Texas 77058
Phone: 281-483-8945
lynda.r.estes@nasa.gov

BLUE ORIGIN, LLC

Kathryn Mireles
21218 76th Avenue S
Kent, WA 98032-2442
Phone: 505-489-5291
kmireles2@blueorigin.com

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND SPACE
ADMINISTRATION
LYNDON B. JOHNSON SPACE CENTER

BLUE ORIGIN, LLC

BY: _____
Julie Kramer White
Director of Engineering

BY: _____
Wade Davis
Senior Commercial Advisor

DATE: _____

DATE: _____